EMILIO STURINO,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Berman:

Q Would you state your name, please, and spell your last name?

A My name is Emilio Sturino, E-m-i-l-i-o S-t-u-r-i-n-o.

Q What is your address?

A My address is 13444 South Medina, Orland Park, Illinois, 60462.

Q What is your present position?

A I am Chief of the Organic Laboratory Section of the Central Regional Laboratory, United States Environmental Protection Agency, Region V.

Q Would you please state your educational background?

A I received --

THE COURT: Excuse me, you will have to speak a little slower. Everything you say is being taken down by the Court Reporter.

MR. HERMAN: Maybe we can save time, if the other attorneys will stipulate to his expert credentials.

MR. OSTROWSKI: It is all right with me.

MR. O'CONNOR: Yes.

THE COURT: Well, except that the Court needs to know he is an expert in what field?

MR. HERMAN: It will only take a minute.

Q Please state your educational background level.

A I received a Bachelor Degree in Science from the University of Illinois, Chicago Circle Campus in 1969 in Chemistry. In 1973 I received my PhD. in Chemistry at the University of Illinois, Chicago Circle Campus.

Q What are your present responsibilities?

A I supervise a group of scientists who are engaged in providing analytical to programs of the EPA. I should clarify, it is the analysis for organic pollutants.

Q How long have you been doing this?

A Since 1973.

Q Did the organic laboratory analyze the samples 06S15 and 06S16 taken April 24, 1979?

A Yes.

Q Could you please describe briefly how the samples were analyzed, what they were analyzed for?

A We were asked to provide an identification of the

organic constituents in the samples. The sample analysis involves two steps. The first step is the sample preparation, the second step is the instrumental analysis of the prepared sample.

The first step involves removal of, or transfer, rather, of organics in a sample to an organic solvent off of the sample matrix. This is accomplished by an extraction technique. After the samples are prepared they are identified and quantified using a computerized gas chromatograph and spectrometer system.

Q Is this a method that is recognized and an accepted method of doing analysis?

A It is for this type of samples.

Q Are there any standards to indicate that?

A Well, it is a similar methodology which has been set forth by the Environmental Protection Agency for analysis of affluents, guidelines for samples, for which affluent guidelines we have been working with for the last two or three years.

Q Are they published in the Federal Register?

A Similar methods on that has been just published in the Federal Register for, I believe, December 3, 1979.

Q When the lab receives its samples, how are they marked,

with a sample number?

A Samples are already labeled, they have a laboratory number with a tag attached to it. I am not sure --

Q Is the sample number on the bottle?

A Yes, that's correct.

Q That is on the bottle when you receive the sample?

A Yes, samples are received by the custodian, a clerk in the sample receiving room. If they are custody handled, there is a custody sheet that accompanies the samples which is used to keep custody of the samples, and the sample numbers are verified to see that what is in the bottle matches what is on the custody sheet.

Q Very good. What compounds were identified in those two samples? Let's take them one at a time.

A Okay. In sample 06S15, the following compounds were identified. There was 2 Methyldodecane, 2 Methyltridecane, 2 Methyltetradecane and several pentadocane and its isomer.

THE COURT: Excuse me. Would you spell those for the Court Reporter?

MR. BERMAN: I can give her a typed sheet. I have a typed copy, I will give it to the Court Reporter.

Q What about the other sample?
A Sample 06S16 contained Xylene and its isomer, Methylethylbenzene, undecane, tetromethylbenzene, M-Cresol, p-cresol, toluene, tetrachloroethane.
Q Did the organic laboratory analyze samples 79-CB48S01 through 79-CB48S04, samples that were acquired approximately August 28, 1979?
A Yes, we did.
Q Could you briefly describe how these samples were analyzed?
A These samples consisted of three soil samples, one of which appeared to be a mixture of liquid and soil. The same analytical approach that was used for the other previous samples was used with these samples, with the exception that the sample number one was divided such that the liquid phase was removed from the solid phase and each portion was analyzed individually.
Q Okay. Were these samples, similar custody and marking procedures followed in these as the other samples?
A That is correct.
Q I am mainly interested, to save time, just the results of the analysis for the following compounds. I am interested in sample 79-CB48S01, I will read it and

you can give me the results on it. The first is P-Xylene.

A There was 40 parts per million in the liquid portion. The sediment portion we had farther sub-divided into two portions so we can have a duplicate analysis to give us an indication of the precision in the measurement. I will give you two measurements for the sediment portion of that particular sample.

Q Okay.

A That was 2200 parts per million and 3400 parts per million.

Q Now, this sample of No. 1, each of the chemicals I am going to list will have three results, is that correct?

A That's correct.

Q m-Xylene?

A That was 4.0 parts per million in the liquid portion, 700 and 1000 in the sediment.

Q That is parts per million?

A That's correct, all in parts per million.

Q All the way down, fine. Now, 2-Ethoxysethanol?

A That was 630 parts per million in the liquid portion, it was not detected in the sediment portions.

A And 2-n-Butoxyethanol?

A. That was 2800 parts per million in the liquid and undetected in the sediment portion.

Q. Isophorone?

A. That was 120 parts per million in the liquid, 2200 and 2600 parts per million in the sediment.

Q. Trimethyl Benzene?

A. That was undetectable in the liquid portion, 1600 and 220 parts per million in the sediment portion.

Q. Pentamethyl Benzene?

A. It was undetectable in the liquid portion, 320 and 350 parts per million respectively in the sediment.

Q. Naphthalene?

A. Undetectable in the liquid portion, 480 and 360 parts per million respectively in the sediment portion.

Q. Methyl Naphthalene?

A. Undetectable in the liquid portion, 150 and 210 parts per million in the sediment portion.

Q. Tetramethyl Benzene?

A. Undetectable in the liquid portion, 1700 and 1800 parts per million in the sediment portion.

Q. That was Sample 79-CB48S01?

A. That's correct.

MR. BERMAN: That is all the questions I have for this witness.

THE COURT: Is there any cross-examination?

MR. O'CONNOR: V & E Corporation has no questions.

MR. LICHT: None by Tectonics.

THE COURT: I assume you are going to have another expert to tell the Court what all this means?

MR. BERMAN: Yes, your Honor.

THE COURT: You may step down, sir.

(Witness excused.)

THE COURT: We will take a short recess.

(After a short recess, the hearing resumed, reported as follows:)

MR. BERMAN: We have another question for Mr. Sturinn, we would like to recall him to the stand.

THE COURT: Is this for an omitted question?

MR. BERMAN: Yes, it is.

EMILIO STURINO,

recalled as a witness by the Government, being previously duly sworn and having testified, resumed the stand and testified further as follows:

DIRECT EXAMINATION
Resumed by Mr. Berman:

Q Doctor, can you identify this item?
A This is a sample custody sheet I spoke about earlier.
Q Now, as to sample 06S15 and sample 06S16, is there an additional number indicating the sample?
A Yes, when we were talking before, we only referred to the last four digits. The full number is 0006S15 and 0006S16.
Q When the sample came in the laboratory was also another sample number marked on it, listed on that sheet next to it?
A The barrel sample number.
Q Let me refer you to the proper sheet under that?
A There is another number in front of each one, BS-4 in front of 0006S15, and BS-9 in front of 0006S16.
Q That all refers to the same?
A That is correct, reference to that individual sample.
Q I don't want to make a mistake, it is BS-4 0006S15 that identifies one specific sample?
A Okay. It is my understanding BS-4 is the number on the seal placed over the lid of the sample, it is not the sample log number by which we at the laboratory track the sample once it is received.

Q But that number comes in, the BS-4 comes in with the sample?

A That is correct.

Q That is on the sample when it comes in and on the seal?

A It is my understanding it is so.

Q The same for the other?

A The next one is BS-9.

MR. BERMAN: Okay. Thank you. May I have the witness excused, please?

THE COURT: Are there any questions? You may step down, sir.

(Witness excused.)

THE COURT: Call your next witness.

MR. BERMAN: The next witness is Dr. Morris.

JOHN B. MORRIS,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Berman:

Q Would you state your name and address, please?

A John B. Morris, 1151 West Grace Street, Chicago.

Q What is your present position?

A Metals Team Leader with the Environmental Protection Agency Laboratory, Central Regional Lab in Chicago.

THE COURT: I would ask you to speak up a little, sir.

MR. BERMAN:

Q Would you repeat your answer?

A Metals Team Leader at the Central Regional Laboratory.

Q With the Environmental Protection Agency?

A The Environmental Protection Agency, yes.

Q Can you briefly give us your educational background?

A I have a BS Degree in Chemistry from Chicago University, a PhD. from Northern University in Boston.

Q Could you give us your employment background briefly, how long have you been with the Agency?

A I have been with the Agency almost exactly two years, prior to that I had a post and experience

at Johns Hopkins University.

Q What are your present responsibilities at the Agency?

A My responsibilities are to analyze and supervise the analysis of samples for metals that come into the laboratory, and oversee and pass it on to my supervisor.

Q Did the Metals Laboratory analyze samples CB4S01 through CB48S14?

A Yes.

Q These are samples that were from what we have previously discussed as the August 28, 1979 sampling. When these samples come into the laboratory, will you please tell us how they were marked with a sample number?

A Okay. The samples for metals are marked with green labels, specifically for metals, and they are labeled with the designated sample numbers, possibly some description of the site the sample is taken from, and signed by the sampler.

Q Now, the sample numbers you referred to, I missed a little bit, but the sample numbers you referred to initially that I referred to, were these bottles marked with those sample numbers when they came in?

A The bottles were marked, the laboratory number on the

labels, yes.

Q Can you briefly describe how the samples were analyzed for four items, lead, cadmium, chromium and arsenic?

A The lead, chromium and cadmium were analyzed by inductively coupled with Argonne plasma atomic spectrograph, except in the cases it was requested under water samples, that the lead and cadmium be analyzed by the graphite furnace if we did not detect anything by the other method. The graphite furnace, otherwise flameless atomic absorption is used for arsenic and cadmium on water sample SO2.

Q You mentioned chromium?

A The chromium was not analyzed by the graphite furnace, by the same method as all the other samples.

Q Are these recognized and accepted methods of doing analyses?

A Yes.

Q Are there any standards to indicate that?

A The graphite furnace has long been accepted for the past several years as an EPA approved.

Q What were the results of the analysis in samples CB48SO1 through S14, take them one at a time. Maybe it would be quicker, since for the lead, cadmium,

chromium and arsenic, I would like you to r
or if you have it in your memory, give us t
for each of the 14 samples for those four i

MR. ENSLEN: Do you have that cap
where it is in writing?

MR. BERMAN: I do have it in writ
consists of a lot of additional items
analyzed. I could submit it, I would
submit it as an exhibit.

MR. O'CONNOR: It all pertains to
term Midco #2 site?

MR. BERMAN: Yes.

THE COURT: Does the written matt
the amounts of lead, cadmium, chromium
arsenic?

MR. BERMAN: Yes, it does. I wil
marked.

(Document produced
Government Exhibi
identification.)

MR. BERMAN: I will ask you if t
listed on those sheets for the sample
to, for the four items I referred to,
the results of your analysis of the 1

analysis of those items?

A Yes.

Q Could you point out what the unit measurements are, the sheets, I think, are clear, but might be a little confusing, for each of the four items?

A For those four parameters the units for CBSO1 and 02 are in micrograms per litre, otherwise known as parts per million, and for the solid samples, 03 through 14 are in microgams, per gram, which is parts per million.

Q Parts per million?

A Yes, per million.

Q Could you explain how the results are displayed on the sheet for the record, how they are listed? Are they listed top to bottom, across the page, or how?

A Okay. In this exhibit they are listed with the parameters vertically and the samples horizontally, with more than one sample on the page.

Q In other words, in the left-hand side of each page is listed the items that were analyzed?

A Right.

Q On the right-hand side of the page is listed the results of the analysis?

A Yes.

Q On the top of the page it indicates which sample num-

ber the results came from?

A Correct.

Q Each of the five pages it is the same?

A Yes.

MR. BERMAN: I want to offer that exhibit into evidence.

MR. O'CONNOR: No objection.

MR. LICHT: No objection.

THE COURT: Let the record show that Government Exhibit 47 is admitted into evidence without objection.

(Document previously marked Government Exhibit 47 for identification is admitted into evidence.)

MR. BERMAN: That is all the questions I have for this witness.

THE COURT: Is there any cross-examination?

MR. O'CONNOR: No questions.

MR. ENSLEN: None.

THE COURT: You may step down.

MR. BAKER: We would ask that this witness be excused.

THE COURT: The request has been made that the witness John B. Morris be excused. Are

there any objections? All right, the request is granted.

(Witness excused.)

TAYSER GOUDA,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Berman:

Q Would you state your name and address, please?

A My name is Tayser Gouda, I live at 1215 East Elm Street, Wheaton.

Q Could you spell your name for the record?

A T-a-y-s-e-r, G-o-u-d-a.

Q What is your present position?

A I am Team Leader of the Metals Section in the Central Regional Laboratory of the Environmental Protection Agency.

Q What is your educational background?

A I have a BS in Chemistry. I have a Master in Chemistry from Byron University, and a Master from Ohio State University. I am a PhD candidate at Ohio State.

Q Can you briefly state how long you have been with the

Environmental Protection Agency and any -- First, how long have you been with the Environmental Protection Agency?

A I have been with the EPA here in Chicago two years. Before that I was working with the Ohio Environmental Protection Agency for four years.

Q What were your responsibilities in Ohio?

A I was Advisor with the Waste and Wastewater.

Q You have been, for the last two years, with the United States Environmental Protection Agency with similar responsibilities?

A I was Team Leader, you know, of the Region.

Q What are your present responsibilities, what does that encompass?

A We are involved in testing for parameters requested from our section which are cyanide phenols, nutrients, amonias, we are responsible for this part of the tests, you know.

Q Did you analyze samples CB48S01 through CB48S14 for cyanide?

A Yes, we did.

Q When these samples came in the laboratory were they marked with sample numbers?

A Yes, the bottles have sample numbers.

Q Marked with the sample numbers I just referred to?
A Yes.
Q How were they marked, taped to the bottles?
A They were written on the bottles, yes.
Q Would you please briefly describe how the samples are analyzed?
A For the cyanide test?
Q Yes.
A What we do is, we do what we call the manual distillation for cyanide, we take part of the sample and we distill it in an acid media to get the cyanide out of the sample, collect it in an absorbent which is a sodium type thing, then we take the sample and analyze it using a technicon otron analyzer.
Q Is this a recognized and accepted method of doing this?
A This is recommended in the EPA Manual, you know, also it is a Federal Register method for running the tests, defined method. It is a method defined in the Federal Register and it is the one required to be used when you want to measure that particular parameter.
Q I want to refer you to Government Exhibit 47. On this exhibit is listed the results for analysis. I will ask you to look at that exhibit.
A Okay.

Q Tell me if that exhibit correctly lists the results for the analysis for cyanide in samples CB48S01 through CB48S14?

A Okay. CB48S01 reads milligrams per litre, which is 2,250, which is the value we got on this sample. The second sample is S02, this is the same value. No cyanide in Sample S03. Then we have got milligrams per kilogram dry weight on Sample No. 4, which is 51.2. Then we have got S05, which is 0.68 milligrams per kilogram, that is Sample S05.

For Sample S06 we have 9.7 and 11.1 for sample --

Q On sample S06, after each one could you give how it is measured, you know, milligrams per kilogram?

A This is the sediment sample, again we take a portion of the sample, weigh it and we know the exact weight and we distill it, then run it through the technicon method, which I described previously, then go ahead and calculate the amount according to the kilogram dry weight basis.

Q Could you read the results for Sample S06?

A Sample S06 is 9.7.

Q That is 9.7 what?

A That is 9.7 milligrams per kilogram dry weight.

Q That is what I wanted.

A I am sorry. Should I go on and read the rest of the samples?

Q Yes. Well, just to save time, if you could, I just want to know if the numbers listed in the exhibit I gave you reflect the results of your analysis of the samples. Could you run through, if you haven't seen the exhibit, run through it quickly and tell me if they reflect that?

A Yes, they are exact values.

MR. BERMAN: I offer the exhibit for the additional purpose of the cyanide results, that is Government Exhibit 47, for the additional purpose of the cyanide results on Samples SO1 through S14 listed on this exhibit.

THE COURT: The exhibit was already admitted with no objection.

MR. BERMAN: Okay. I have no further questions of this witness.

MR. ENSLEN: No questions.

MR. O'CONNOR: No questions.

MR. OSTROWSKI: No questions.

MR. LICHT: No questions.

THE COURT: You may step down, sir.

MR. BERMAN: May this witness be excused?

THE COURT: The witness may be excused.

(Witness excused.)

CRAIG HENSHAW,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Berman:

Q Would you state your name and address, please?

A My name is Craig Henshaw, I live in Indianapolis, Indiana.

Q What is your present position?

A I am a Supervisor at the Indiana State Board of Health, I work in the Water and Wastewater Laboratory.

Q Briefly what is your educational background?

A I graduated from Indiana University with a BA, and I have one year of graduate work at Butler University.

Q What was your BA in?

A In Chemistry.

Q What is your employment background, please?

A I have worked for 17 years at the Indiana State Board of Health in the Water Pollution Chemistry Section.

Q Have you been a Supervisor in that Section?

A At the present time I am the Supervisor in that Section, I have been the Supervisor for approximately five years.

Q What are your present responsibilities?

A I am in charge of the analytical work and quality control in the Water Pollution Chemistry Section.

Q In other words, if you get samples coming into your laboratory, your section analyzes them?

A Yes.

Q Did your laboratory analyze Samples 1500, 1503 and 1502 for the year 1977?

A Yes.

Q When these samples came into the laboratory were the samples marked with those numbers I just referred to?

A No, the inspectors collected the samples and identified them with their markings and submitted those in person to the laboratory. Then we assigned our laboratory numbers to the samples, and the 1500 numbers were our laboratory numbers.

Q Okay. Do your records indicate what the numbers were, what the sampler numbers were?

A The field identification sheets indicated the description from the inspectors, and on the same

sheet our laboratory numbers were placed, you know, by our personnel.

Q Do you have the Field Inspection Sheets with you?

A I have some copies of those.

Q Could you find those, we want to be very specific about this. Are the field sample numbers on those sheets?

A There is an identification and there is a station number on the sheets from the collectors.

Q Could you read the collectors' names and field identification and station number for each one, 1500, 1503 and 1502, please?

A Yes. 1500 was the Midwest Industrial Waste Disposal sample, I guess that was from the drum in the yards identified as gutter sludge, Station No. 2 with the date and the time of collection, 6/16/77, 2:30 P. M. was the collection date and time. The collectors were Jim Hunt and Rick Stapinski.

Q Now, could you do that for the other two samples?

A Yes, 1502 was Midwest Industrial Waste Disposal, Gary, sample from drum in the yards, appears to be a cleaning solution, Sample No. 4 of sampling of 6/16/77 at 3:00 P. M. Collected by Jim Hunt and Rick Stapinski.

Q Okay, and the third?

A Yes, 1503 was our laboratory number, identification from the field personnel was Midwest Industrial Waste Disposal, Gary, sample taken from drum in the warehouse, clear liquid, Station No. 3, sample date 6/16/77, at 3:00 P. M., collectors Jim Hunt and Rick Stapinski.

Q Each one of the field sheets is marked with your lab numbers stamped on it when it comes in, is that correct?

A Yes.

Q Then that laboratory number is put on the sample bottle, is that correct?

A Yes, it is.

Q How did your laboratory analyze these samples for cyanide?

A The procedure that was used for cyanide was a reflux distillation procedure followed by a pyridine barbiturate, chlorometric procedure. This procedure can be referenced to the 14th Edition of Standards Methods for Examination of Water and Wastewater.

Q Is that a recognized and accepted method of doing the analysis?

A Yes, it is.

Q What were the results for each sample for cyanide?
A Laboratory No. 1500 was 10,000 milligrams per litre cyanide. Sample 1502, laboratory number, was 102 milligrams per litre cyanide. Laboratory No. 1503 appears to be 240 milligrams per litre cyanide.
Q Did your laboratory also analyze samples 765 and 766 for the year 1979?

MR. ENSLEN: Excuse me, before you get into that, all of the previous testimony related to Midco #2?

MR. BERMAN: Right. What I wanted to note to you is that the following two samples I am going to discuss are from Midco #1.

THE WITNESS: What was your question?

MR. BERMAN:

Q My first question, did your laboratory analyze Samples 765 and 966 for the year 1979?
A Yes, we did.
Q Were these processed in your laboratory in a similar manner as the ones we previously discussed?
A Yes, they were.
Q Do you have Field Sheets for those two samples?
A I have got copies of the Field Sheets.
Q Fine. Could you identify each of those samples as to

how you identified the previous ones?

A Yes. Laboratory No. 765 had a field identification as Midco, 15th Avenue, Gary, Station BS-7 trough. The sample date, collection date, was 4/24/79, collected in the morning by King and Hunt. Laboratory No. 766 was identified by the field personnel as Midco, 15th Avenue, Gary, Station No. BS-8, cyanide barrel. The sampling date was 4/24/79 in the morning, collected by Paylon, King and Hunt.

Q The second one was marked with what laboratory number?

A It appears to be 766 from my copy.

Q How did your laboratory analyze Sample 765 for phenols?

A The phenol procedure again is taken from the 14th Edition of the Standard Methods, consists of a distillation procedure, followed by a chlorometric procedure, followed by a chloroform solvent extraction.

Q Is that an accepted and recognized method of doing the analysis?

A Yes.

Q Could you please tell us the results of that analysis?

A Laboratory No. 765 for phenol, 990 thousand milligrams per kilogram.

Q How did your laboratory analyze 766, Sample 766 for chromium, lead and cyanide?

A The cyanide procedure was the same procedure I mentioned previously. Shall I go over it again?

Q No, that is fine.

A You said lead?

Q Lead.

A They were both done by digestion followed by atomic absorption.

Q Was that a standard method of doing this, recognized and an accepted method of doing the analysis?

A Yes, it is. This procedure is taken again from the 14th Edition of Standard Methods.

Q What were the results of your analysis on 766 for chrome, lead and cyanide?

A The results for chrome, the total chrome was 48,000 milligrams per kilogram, the lead was 12,000 milligrams per kilogram, the cyanide was 830 milligrams per kilogram.

MR. BERMAN: That is all the questions I have.

MR. O'CONNOR: No questions.

MR. ENSLEN: No questions.

CROSS-EXAMINATION
By Mr. Ostrowski:

Q The 765 was taken from a barrel, you say? What kind of sample are we speaking of?

A The only information I can give you on the laboratory No. 765 was the identification the inspector placed on the Field Sheet when it was submitted to the laboratory.

Q You have no indication whether it was from a barrel?

A I was not involved in the collection.

MR. OSTROWSKI: Okay, no more questions.

THE COURT: You may step down, sir.

(Witness excused.)

THE COURT: We will take a recess at this time. Does the Government intend to call an expert to explain what the figures mean?

MR. BAKER: Yes, we do, we have Dr. Meyer.

THE COURT: We will take a recess and resume again at 1:30.

(At 12:00 o'clock noon the hearing was recessed, to reconvene in the afternoon the same day, January 8, 1980.)

JAMES HUNT,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Baker:

Q Would you state your name, please?

A James Hunt.

Q What is your occupation, Mr. Hunt?

A I work in the Indiana State Board of Health at Indianapolis. I am an employee in the Water Pollution Control Division.

Q How long have you been so employed?

A Approximately 10 years.

Q What are the duties and responsibilities of yourself in this position with the State Board of Health?

A I am co-ordinator in the Industrial Waste, SPC-17.

Q Did you have occasion to make sealed inspections of the site known as Midco #1 and Midco #2?

A Yes, I have.

Q Directing your attention to June of 1977, did you have occasion to take any samples at a location known as Midco #2?

A Yes, I did.

Q When did you take samples?

A June 16, 1977.
Q Would you state whether or not you identified one sample you took as Midco drum in yard, S2?
A There were several, approximately four samples, I believe taken on that day. One was identified as sample from drum in yard, yes.
Q Sample 2?
A Yes.
Q Where was that taken, sir?
A That was taken from the Midco #2 property at the Industrial Highway site along on the east side of the driveway immediately after entering the property.
Q Did you take a sample designated as Midco drum in yard, Sample 4?
A Yes, I did.
Q Where was that taken?
A That was taken from the same area as Sample No. 2, a number of drums located in the same area.
Q Did you have a sample you designated as Sample 3?
A Yes, I did.
Q How did you designate that sample?
A That was the sample taken from a drum in the warehouse at the Midco #2 site.
Q What did you do with the samples after you took them,

sir?

A Okay. The samples were collected, the containers were identified in the field. I took them back to the Indiana State Board of Health and kept them in my possession until the next day, and delivered them to the laboratory.

Q Have you had occasion to see any of the drums you sampled on June 16, 1977 since then, sir?

A Yes, sir, I have.

Q Where are they located now?

A The most recent inspection made at the site was December 14, 1979.

Q At Midco #2?

A Right, and the drums, these drums appeared essentially as they were at the time of the sampling.

Q Which drums?

A The drums which contained cyanide.

Q Including the drum in the warehouse?

A There were still drums in the warehouse. Because of the fire which occurred, it was impossible to identify these drums.

Q The drums in the yard that you sampled, 2 and 4, were they still there?

A I could not say those exact drums were still there.

That particular area looked like it had been untouched since the last inspection.

Q Did you have occasion to visit the site known as Midco #1?

A Yes, I did.

Q When did you first visit that?

A Okay. The first visit was September 16, 1976.

Q Do you know who was operating that site at that time?

A Yes, at that time I met with Ernest DeHart.

Q Did there come a time you learned of any change in the company or the people operating that site?

A Yes, on October 26, 1977 at the request of Mr. Al Tenny, we held a meeting at Indiana State Board of Health.

Q Who was present at the meeting?

A Mr. Tenny and Charles Licht.

Q Following that meeting did you understand, or who did you understand was operating at the Midco #1 site?

A Yes, during the meeting Mr. Tenny and Mr. Licht indicated that they had intentions of operating at the Midco #1 site.

Q Did they give you any indication of what they intended to do in their operation?

A Yes, they indicated the operation was to be for the

limited period of time until they could find a new site and would consist basically of bringing in drums in bulk, solvents and segregating the material, transfer it to bulk tanks, and selling the materials for reclamation for a field program.

Q Could you state whether at that meeting you had there was conversation concerning accumulation of drums at the site?

A Yes, we did. We were assured there would be no accumulation of drums at the site, they would be brought in, and within a reasonable period of time emptied and the material shipped out.

Q Would you state whether or not your inspection of the site indicated compliance with that assurance?

A Yes, I made several inspections at the site since then. One was on October 26, 1977, two days after the meeting.

Q What was the condition of the site at that time, sir?

A Okay. The site was active. Mr. Harold Egan of the company at that time accompanied me on an inspection. The drums were being emptied, material was being put into bulk tanks, there was no new accumulation of drums that I could detect.

Q When you say accumulation, were there any non-fire

damaged drums at the site?

A There were some, yes, some fire-damaged drums, particularly along the north border of the property.

Q Any drums not fire damaged there at that time?

A Yes, along the northern border of the property there were drums not fire-damaged.

Q How many drums would that consist of?

A I didn't count them. I would estimate a couple of hundred drums.

Q I hand you what is marked Government Exhibit 7, and ask if you are familiar with that area depicted on that photograph?

A Yes.

Q What is that area?

A This is the Midco #1 site.

Q Does that depict intact non-fire damaged drums that you observed in October of 1977?

A Yes, it does.

Q Where are they?

A They are located along the northern border of the property.

Q Near the woods?

A Yes.

Q Are there any intact drums on the premises now?

A Yes.
Q Are they depicted in that photograph?
A Yes.
Q Where are they, sir? Can you hold it up so that we can see it?
A The drums located again along the northern border of the property and also drums in the area where INTEC has been operating.
Q I hand you Government Exhibit 9 and ask if you can identify that?
A Yes, I can. This is the Midco #1 site.
Q Does that depict non-fire damaged drums?
A Yes.
Q That were not there when you visited the property in 1977?
A Yes, the drums in this area here (Indicating.), were not there in 1977.

MR. BAKER: No further questions.

MR. O'CONNOR: No questions.

CROSS-EXAMINATION
By Mr. Licht:

Q Mr. Hunt, at the time of the inspection, shortly after INTEC took over in 1977, did you make a count of the drums, the unburned drums on the site?

A No, I didn't.
Q Did you make any record in your record book as to the number of drums on the site?
A Based on the information that I --
Q I just asked whether you made any record of the number of undamaged drums you saw on the site. Do I gather your answer is you did not?
A I did not, that is correct.
Q Now, at the time you were there on the inspection did you walk the perimeter of the property, specifically, to determine the number of unburned drums that were there?
A I walked along the east and north sides of the property. I can't recall that I walked around the entire perimeter of the property.
Q Therefore your view of the property was to a certain extent circumvented by the angle of investigation available to you at that time, the east and north sides?
A That is true.
Q You did not go around the entire property?
A No, I didn't.
Q You didn't specifically go to count the number of drums?

A No, I didn't.

Q Now, the Government showed you a photograph and asked you whether this represented the number of drums at the time, and without having any record or any count, you said the photograph, which is June of 1979 was the same as 1977?

MR. BAKER: Objection, there was no such question and no such answer that the drums were the same in 1977 and 1979. In fact, the testimony, and the questions were not those words, but exactly contrary to that, the drums and the count were not the same in 1977 and 1979. Those are no where near the words of the question I asked.

MR. LICHT: Excuse me.

Q You stated that in 1977 you had not seen drums on this photograph, yet you did not have a count, you did not have a perimeter view of the property and you didn't specifically inspect for the number of drums; isn't that correct?

A That's correct.

Q So you really cannot say for certain whether the number of drums shown in Government Exhibit 9 was or was not the same number of drums as were on the

property when you inspected it in 1977? You cannot say with certainty that it was, you haven't made a count?

A I can only say in the areas where I did inspect, the northern border of the property in the area INTEC was operating there, definitely the drums on the northern boundary of the property appear essentially the same. There are more drums in the area where INTEC is operating now than there were in 1977.

Q But the quantity of drums you cannot ascertain because you didn't count it in the first place, and you have no record of it?

A I can't give an exact count.

MR. LICHT: Thank you.

CROSS-EXAMINATION
By Mr. Ostrowski:

Q Mr. Hunt, I am primarily interested in these lots here (Indicating.), 41 to 48, using these exhibits. Your testimony was that you had walked the east and north sides of the property, is that right?

A That's correct.

Q Now, in relation to the drums that are shown on these photos, would any of these -- This would be reversed -- Would any of your testimony relate to any of the

intact drums being perhaps in this area? (Indicating.)

A No, the purpose of the inspection basically was to review INTEC's operation.

Q I am trying to pinpoint any testimony relevant to this property?

A No.

MR. OSTROWSKI: Okay. Nothing further.

THE COURT: Any further redirect?

MR. BAKER: No, your Honor.

THE COURT: You may step down, sir.

(Witness excused.)

THE COURT: Call your next witness.

EUGENE MEYER,

called as a witness by the Government, being first duly sworn to testify the truth, the whole truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION
By Mr. Berman:

Q Would you please state your name and your office address?

A My name is Eugene Meyer, my office address is 610 South Canal Street, Chicago.

Q What is your present position?

A I am a chemist employed by the United States Environmental Protection Agency, Region V.

Q What is your educational background, please, state the degrees you have, what schools they are from, and what subjects they are in?

A I have a BS in Chemistry from Lewis University in LaPorte, Illinois, a PhD in Chemistry specializing in Nuclear Chemistry from the Florida State University. I have an additional year of post-research at the Institute of Nuclear Physics Research in Amsterdam.

Q That is in the Netherlands?

A Yes.

Q What were your educational specialities?
A My educational specialities are in the fields of Nuclear and Physical Chemistry.
Q What is your employment background?
A For the 14 years prior to my employment with USEPA, I was Professor of Chemistry, and Chairman of the Division of Natural Sciences at Lewis University. where I was employed for the last 14 years.
Q What is your present job description?
A My present job description entails going to various sites where hazardous materials have been generated, stored or disposed, and assessing the site with regard to their potential hazard to the environment and health.
Q What publications have you had?
A I have --
Q Well, to save the Court's time, do you have a list of your publications?
A Not here.
Q Is this a list of your publications, would you identify this?
A This is the list of my publications.

MR. BERMAN: Let me mark this as an Exhibit.

(Document produced was marked Government Exhibit 96 for identification.)

MR. BERMAN:

Q This is Government Exhibit 96. Would you please identify that?

A Yes, this is a list of my publications. Do you wish me to read it?

Q Please briefly read that. Well -- Okay, go ahead.

MR. O'CONNOR: Excuse me, if you want to put it in evidence, we will agree it goes into evidence, and agree those are his publications, to save time.

THE COURT: Let's do it that way.

MR. BERMAN: Yes.

Q But I would like you, for the Court's education, to read the last three publications on the list.

A Yes. I am the author of two books, "Chemistry of Hazardous Materials", published by Prentice-Hall in 1977, and "The Introduction to Modern Chemistry", also published by Prentice-Hall in 1979. I am currently in the preparation of a third text which is not yet on the market.

MR. BERMAN: I offer Government Exhibit 96 into evidence.

MR.O'CONNOR: No objection.

THE COURT: Let the record show that Government Exhibit 96 is admitted into evidence by stipulation.

(Document previously marked Government Exhibit 96 for identification is admitted into evidence.)

MR. BERMAN:

Q Have you taught any seminars?

A Yes, I have taught several seminars, especially in the area of hazardous materials to firemen and to other safety-conscious individuals regarding handling of hazardous materials, as well as the proper precautions to be taken in extinguishing fires involving hazardous materials.

Q Could you identify this list? It is a brief one, I would like you to read that.

A Yes, this is a list of several seminars which I have given since my employment with the USEPA regarding Federal Requirements Regarding Chemical Waste Disposal.

Q Who have you taught in the seminars?

A A variety of different people, Sanitary Engineers, various safety-conscious individuals ranging from

firemen to Environmental Engineers, Civil Engineers, et cetera.

MR. BERMAN; I would like to have this marked as Government Exhibit 97.

(Document produced was marked Government Exhibit 97 for identification.)

MR. BERMAN: I would like to offer that into evidence. This is who he taught the courses to on Federal Requirements Regarding Chemical Waste Disposal.

MR. O'CONNOR: No objection.

MR. LICHT: No objection.

THE COURT: Let the record show that Government Exhibit 97 is admitted into evidence by stipulation.

(Document previously marked Government Exhibit 97 for identification is admitted into evidence.)

MR. BERMAN:

Q How did you initially get involved with the subject of hazardous materials?

A I was first approached by one of the Deans from the Joliet Junior College in Joliet, Illinois, and asked to teach a course to the local firemen regarding,

especially, the chemistry of hazardous materials. This was, I believe, somewhere around 1974. Since that time I have taught the course about six, seven, eight times.

Q Where have you taught the course?

A On the Joliet Junior College campus.

Q How did you initially get involved in writing text books on hazardous materials?

A Upon agreeing to teach the course I discovered there was not a textbook available, and consequently it was necessary for me to do considerable research into the area of hazardous materials myself, each time adding additional material until finally I was approached by a representative of Prentice-Hall and asked if I would be interested in compiling my notes into the form of a book.

MR. O'CONNOR: Excuse me. Unless the Court wants to hear more of this man's qualifications, V & E Corporation would admit he is a qualified expert in hazardous materials and chemicals.

MR. BERMAN: Your Honor, there are only a few more questions in the area and we think it is important.

THE COURT: All right, proceed.

MR. BERMAN:

Q Are you ever contacted with questions concerning hazardous materials?

A Yes, on the average, especially I am contacted by phone from individuals across the country, in fact, asking for recommendations concerning everything from, extinguishing fires involving hazardous materials to proper storage practices.

Q Have you ever been consulted about an arson case?

A Once I was consulted about an arson case.

Q What professional organizations are you a member of?

A I am a member of the Combustion Institute and the American Chemical Society.

Q What honorary societies are you a member of?

A I'm a member of the Delta Epsilon Sigma.

Q Were you ever contacted as a consultant?

A Yes, I have acted as consultant at the Argonne National Laboratory, a consultantship which I held all the way up to my appointment with the USEPA.

Q How many years is that?

A That is 14. I also was a consultant at Amalco Chemical Corporation.

Q Have you inspected the site previously described as 7400 West 15th Avenue, which we referred to in this

hearing previously as Midco #1?

A Yes, I have inspected the site.

Q Let me refer you to aerial photographs. I would like you to look at Government Exhibits 7, 8 and 9, and ask if you can identify -- Is that the site you just referred to, 7400 West 15th Avenue?

A Yes, sir, these are photographs of that site.

Q Okay. When was it you inspected that site?

A On the 7th of September, 1979 I first inspected the site together with Al Baumann of the USEPA. Again on the 13th of November I inspected the site, and on the 13th and 14th of December of last year I inspected the site.

Q What did you observe at the site?

A At the site there are thousands of drums of chemical waste stored sometimes two to three drums one on top of the other. There appears to be a segregation of material in that flammable solvents are stored in one area, whereas corrosives and oxidizers are stored in another area, this information being obtained by a reading of the labels on the drums. There is also evidence on the site of a former fire. In the rear of the site are large numbers, thousands of drums burned out, burned-out drums.

The soil permeates from the odor of various chemical wastes which have saturated the soil. In another area there is a concrete base below which more hazardous wastes are stored. In the rear to the left upon entering the site one can also see puddles, large puddles of hazardous liquid waste.

Q Referring you to the photograph -- Let me get the best one -- Referring you to Government Exhibit 8, does that fairly depict the site as of your last inspection? It is a little marked up, you can look at one of the others if you wish.

A No. There appears to be no substantial difference from the last time I inspected the site, relative to this photograph.

Q I would like you to, if you could, point on the photograph and indicate where you refer to. I will show you specific items, like where are the burned out barrels, could you show on the photograph where you were referring to?

A I don't know how you want me to describe this, but in this area right in here, through in here. (indicating.)

Q The upper left side of the photo?

A Yes.

Q Not quite at the top?
A Yes.
Q Below the dirt road?
A It is below the dirt road.
Q Okay. Could you also point out the marshy area you were referring to?
A In the rear of this property --
Q Is it on the photograph?
A As a matter of fact, it is off the photograph.
Q Where is it, do you know if it is on the north side?
A It would be back in here (Indicating.), on the north side, yes. There is a marshy lagoon which had several drums floating in it at the times of my inspections.
Q You mentioned, I believe, did you mention there were some segregations of incompatible wastes?
A Yes.
Q Could you demonstrate on the photo where the different wastes were stored?
A Yes, it is apparent in the photograph, there is this entrance road through here. (Indicating.)
Q I believe we referred to that as Blaine Street.
A All right. To the left of Blaine Street are the various chemical wastes which are flammable solvents.
Q When you say left, you mean coming in from the south?

A Yes; whereas to the right in the rear are corrosive materials, acids and bases. In front of that are oxidizers. There are approximately 50 or so drums containing oxidizers. There are maybe 155 to 200 drums containing corrosive materials, and of course, there are many thousands of flammable solvents in the other area.

Q How have you identified the barrels?

A How did I identify them as?

Q At the different times?

A The Department of Transportation requires various labels be attached to drums when they are involved in transportation. Three of the types of labels in question here are flammable liquids, oxidizers, and corrosive labels. On many occasions in chemical waste samples those labels are in fact not an indication of what the contents of the drums might happen to be, however in this case it appeared that they were a true indication of the contents, since they were all segregated according to their hazard. As I mentioned earlier, corrosives in one area, oxidizers in the other, and flammable solvents in the third area.

Q What is a bulging drum, or why would it bulge?

A Some drums on the site are bulging, which occurs from

build up of internal pressure due to large amounts of vapor on the inside of the drum. This can happen, for example, during a fire when the contents are super heated beyond the ambient temperature, such as there is a large amount of vapor internally and pressure accordingly builds up.

Q Is there any danger from a bulging drum?

A Yes, bulging drums are much more seriously hazardous than a drum containing hazardous materials, since it is literally a potential bomb, it could burst quite easily when the steel content of the drum, the steel make-up of the drum gives way.

Q Can you describe the accessibility to the site at the time you made your inspections?

A Yes, it was quite easy on all four occasions to enter the site. At the entranceway a cable crosses it, however one can walk immediately to the right of the cable, or for that matter you could step over it or under it. There is absolutely no difficulty at all in entering the site. Furthermore, the back of the site and the right of the site do not have fencing whatsoever, so even if the cable were not there, the accessibility would be quite direct.

Q Were there any guards at the site?

A There were no guards. In fact, I did not meet any other non-EPA people while I was on the site.

Q This was at the time -- A similar condition prevailed at the time of your last inspection?

A That is true.

Q On April 24, 1979, the State of Indiana Board of Health made an inspection of the 15th Avenue site, which is what I referred to in the picture and you have identified, and took samples and made an analysis that revealed the following chemicals:

2-Methyldodecane, 2-Methyltridecane pentadecane and its isomer, undecane Methylethylbenze, tetromethylbenzene Xylene, toluene.

Could you please characterize these chemicals?

A Yes, as a group these various chemicals that you mentioned are flammable, upon contact with an oxidizing agent they burn in several examples, particularly Xylene and toluene. These materials are known to be carcinogenic when ingested.

Q What is a flash point?

A The flash point is the temperature of the vapor above a liquid at which a momentary flash will occur.

Q What is the significance of the flash point test?
A The flash point is an indication in the field of fire science rather broadly of the hazard, the fire hazard of that particular liquid. For example, if we had a material that happened to have a flash point of zero degrees Fahrenheit, this would mean any temperature beyond that would be the right conditions for that particular material to burn, assuming that it was supplied with an ignition source. Generally sustained combustion would occur about ten degrees Fahrenheit above the flash point.
Q What are ignition sources, what are possible ignition sources?
A Possible ignition sources are anything whatsoever that would simply energize, this could be a match, a cigaret, the contact of metal upon metal, generating sparks, such as puncturing a drum, and perhaps a natural source such as lightning.
Q Let me give you some information first. On December 17, 1979 the USEPA took samples from drums at 7400 West 15th Avenue. The results of these samples shows a flash point of equal to or lower than 63 degrees Fahrenheit, 70 degrees to 68 degrees Fahrenheit, equal to or lower than 65 degrees Fahren-

heit, equal to or lower than 55 -- Equal to or lower than 65 degrees -- Let me go to No. 3. Equal to or lower than 65 degrees Fahrenheit, equal to or lower than 55 degrees Fahrenheit. No. 5 is 124 degrees Fahrenheit. No. 6 is 66, equal to or lower than 66 degrees Fahrenheit. No. 7 is equal to or lower than 55 degrees Fahrenheit. I would like to note that the sample numbers had different numbers on them.

What is the significance of those flash points?

A In all of these examples, with the exception of the value of 124 degrees Fahrenheit, these various solvents would be considered as very flammable. In fact, the National Fire Protection Agency would classify these as, well, in their sense of classification, as Class 1-A liquids. A Class 1-A liquid is any liquid that has a flash point less than 73 degrees. Once again, with the exception of the 124 degree sample, all of these would be considered very hazardous flammable liquids.

Q What would be the effect of weather below 50 degrees Fahrenheit on igniting these types of materials?

A Would you repeat the question?

Q What would be the effect of colder weather, for ex-

ample under freezing, let's say 32 degrees Fahrenheit?

A On these particular samples?

Q On these particular samples.

A Yes. Well, in colder weather the materials would more than likely be below their flash point, and even with an ignition source they more than likely would not burst into flame.

Q What would be the result, let's say, if you had weather below 32 degrees Fahrenheit and had a mixture of incompatible chemicals?

A A mixture of incompatible chemicals, such as these flammable solvents and oxidizers which were indicated earlier as being across the entrance way, across Blaine Street, the mixture of these two types of incompatible chemicals would lead to a chemical reaction which is exothermac, that is, it would give off heat and then we would have a situation somewhat similar to the development of a spontaneous combustion, that is, a slow amount of heat may build up rather slowly, but it would ultimately get to a point where a self-contained combustion would result. On a site such as this where there are thousands of drums, this would undoubtedly lead to a very major fire.

Q If in this case the drums you refer to as oxidizers

and corrosives on the east side of Blaine Street were moved over to the west side of Blaine Street near the solvents, what could be the possible hazard?

A The possible hazard would be one of fire. Those various drums on the east side of Blaine Street are in very poor condition, many of them are corroding, the contents are either leaking or on the verge of leaking. Removal, unless done very gingerly would undoubtedly lead to further spillage, and thereby contact of the oxidizers, especially upon the flammable solvents in the other area leads to a very potential build-up of reacting materials, such that a fire would be imminent.

Q Is this fire still possible from a mixture of incompatible materials at below 32 degrees Fahrenheit?

A Yes, it would be possible at any temperature whatsoever achievable in this part of the country.

Q If someone threw a match or cigaret into the area where the solvents are stored, what would be the potential hazard of that?

A This would depend upon whether or not the match or cigaret contacted a sufficient amount of vapor to cause it to burn, and whether the vapor was approximately about ten degrees above its flash point. Once

again, in weather of the nature we have in January in this part of the country, that would probably be little likelihood of fire by means of ignition. On the other hand, in the summertime this would be most likely.

Q Could you give us more information on exactly how that fire would start and spread?

A Yes, in order for a fire to occur a number of ingredients must be simultaneously present. The concentration of vapor must be between what is known as the upper and lower explosion limits. These are simply concentrations between which a vapor will either not burn or will burn. For example, for the substance hydrogen, its flammable limits are four per cent and 75 per cent. Once again, if a concentration of vapor is between those limits the substance will burn; if it is below or above it the substance is respectively too lean and too rich in vapor to burn.

MR. LICHT: May it please the Court, I don't believe that hydrogen has been brought up as one of the --

THE WITNESS: No, hydrogen is not.

THE COURT: I think it is simply an example of what he was trying to say. The objection is

overruled.

MR. BERMAN:

Q Go ahead.

THE WITNESS:

A One also must have the liquid, as I mentioned earlier, at least at the flash point, preferably ten degrees above its flash point.

Q Let me say, for example, let's say it is middle temperature and you spilled some solvents on the ground and threw a match in there, would that be likely to ignite?

A At which temperature?

Q Middle temperature, between 40 and 60 degrees?

A If the flash point of the material was between 40 and 60 degrees, and if you had a spill on the soil and if the concentration of vapor was such that it was between its flammable range, yes, the material would burn. If any of the conditions were not met, the material would not burn.

Q I want to refer you to Government Exhibits 92 and 91. There was testimony concerning these two exhibits and I would like you to look at them, this is at the site at 7400 West 15th Avenue. Those pictures show barrels that were moved from the east side of Blaine Street to the west side of Blaine Street. Could you

comment on the hazard that that may present? I don't mean you to be repetitious, but I would like you to comment after looking at that specific evidence.

A Yes.

MR. O'CONNOR: Just a minute. The Defendant V & E Corporation objects to the question being asked. He can ask if he has an opinion as to what would happen if these things were moved, but to just let him comment on what possibility -- They have already been moved and nothing happened. I think it is an improper way to examine the witness.

MR. BERMAN: I would be glad to rephrase it.

THE COURT: I don't have so much trouble with the form of the question under the new Rules of Evidence, but I do have a problem with the lack of foundation. Unless the witness knows what is in the barrels, which seems to me to be the most important single element of the question, I don't see how he can answer.

MR. BERMAN: Okay. I will rephrase the question.

Q If barrels containing corrosives and oxidents that were leaking were moved into an area where solvents

were in barrels that were corroding and leaking, what would be the possible hazard, in your opinion?

A The hazard would be one of fire. The chemical reaction between flammable solvents and oxidizers is a well-known one. An oxidizer is a substance which contains its own oxygen chemically incorporated into the structure of the material, such that it doesn't need atmospheric oxygen to support combustion. Consequently the oxidizers, especially, are very chemically reactive materials, upon contact with flammable solvents would most likely generate a flame.

Q If there is a fire at the site and you had a closed drum with flammable liquid inside, what would happen, in your opinion?

A If there is a fire at the site that comes in contact with drums that are closed containing liquids, the liquid would heat up, vaporize, would either bulge -- The drum would either bulge or burst. A bursting drum would be a particularly hazardous one because the vapor has been super heated beyond its ordinary ambient temperature. Upon exposure, upon rupturing, it would be immediately in contact with the ignition source, and one would have a major fire ball at that particular site.

A. The initials stand for the National Fire Protection Agency, or Association.

Q. Have they done any other codes besides the electrical code?

A. Yes, they have developed flammable and combustible liquid codes.

Q. Do they have any guidelines for proper storage of chemical drums?

A. Yes, they do.

Q. Would these be drums that are at the site of 7400 West 15th Avenue?

A. Yes, any drum that is used at all for combustible and flammable liquids.

Q. What are the guidelines to proper storage of chemical drums?

MR. O'CONNOR: Just a minute. Your Honor, I don't want to be here again tomorrow, and I don't know the relevancy, none has been shown, and it has not been shown that anybody here is bound by the NFPA standards.

THE COURT: Well, it is being offered as a standard, the Court has a right, I think, to accept or reject standards. In this case, I am going to accept the standards. You may proceed. The

Q. What if there was just, when it ruptured, just a small hole, or a pin hole that had ruptured?

A. A pin hole would mean that the pressure would be relieved through the pin hole, such that the drum could literally jettison hundreds of yards into the air or off in any direction. This is particularly hazardous to the fire fighters who might happen to be at the scene of the fire, since contact with the drum could lead to dismemberment, disembowelment, or whatever, even death, of course. In fires, fires of this nature, these are very classic hazards.

Q. What is the NFPA?

A. The NFPA is a non-profit organization of some 30,000 individuals who are primarily interested in fire service, members of industry who exchange information and adopt various safety regulations or recommendations that are then dissipated throughout the country. A common example, the sort of work they do, for example, is the development of a National Electrical Code. Again, this is just a recommendation, but many municipalities will adopt these codes. In the case of the National Electrical Code, it was obviously adopted nationally.

Q. What do the initials stand for?

objection is overruled.

THE WITNESS: Would you repeat the question?

MR. BERMAN: Yes.

Q. What are the NFPA guidelines as to the proper storage of chemical drums?

A. When drums are stored outside of buildings, they should be stored in such a manner that they are protected against tampering or trespassing, suggesting proper fencing, at least, to protect ordinary vandalism.

Also, suitable fire control devices, minimally portable fire extinguishers, hoses, this sort of thing should be immediately available. Also liquids are stored, or it is suggested they be stored in areas that do not exceed certain numbers. These again, are dependent upon class of material, which in turn is dependent upon flash point.

From our earlier knowledge of the fact that most of these liquids have a flash point of less than 73 degrees Fahrenheit, the NFPA suggests no more than 1100 gallons of such materials be stored in individual lots on a particular site. If a 55-gallon drum were completely filled, this would mean 20 drums to each lot.

Now, each of the various lots should also be segregated by a minimum of five feet, and should all be accessible by emergency fire fighting equipment.

Q. How high, is there a recommendation as to how high the drums should be stacked?

A. There is no recommendation regarding height, it is just simply the volume of material in any one lot.

Q. Is it prudent of a facility to have a fill provision?

A. Yes, in terms of tanks, it is recommended that they be diked. The various drums should be stored also on a stable surface, concrete or pallets.

Q. In your professional opinion are the NFPA standards generally recognized and accepted as proper standards?

A. Yes, many, many cities have adopted the flammable and combustible liquids codes.

Q. Does the site that we referred to in the photos, described as 7400 West 15th Avenue, in which you have visited on several occasions, met these criteria?

A. There is no evidence that the Midco #1 site is in compliance with any of the recommendations.

Q. Could you be a little more specific per each recommendation?

A. Yes. There is no evidence that the various materials had been stored in lots whatsoever; the drums are

jammed one next to the other, two and three high, there is just absolutely no evidence at all that any segregation of quantity byvolume has been made. Although it is possible to enter one part of the site with a fire truck, it is questionable whether or not a stream of water would be successful in the rear of a fire for cooling drums, or whatever, or extinguishing a fire.

Q. Why is it questionable? I am asking you to be a little more specific, why water would not get to the rear, since you said you could enter one part of the site?

A. Yes, you can enter one part of the site, but the massive number of drums would prevent you from getting into, getting beyond that point. There was no evidence of any sort of emergency fire-fighting equipment, such as portable fire extinguishers. Two sides of the lots, once again, were not fenced, so ordinary vandalism is quite possible. I believe that covers all of them.

Q. Are you familiar, when you go in the site from the south, along the dirt track referred to as Blaine Street, are you familiar at the time you inspected it--I will point it out in the pictures--there was a little entranceway to the dock area, I will point that out (indicating).

A. That's right.

Q. It is indicated on the picture?

A. Yes, I have seen that.

Q. If that road, if the dock is blocked by drums, how would this affect--

A. This would further hamper the entry of emergency fire-fighting equipment.

Q. Have you seen any evidence of NFPA practice at the site?

A. There is no evidence of any NFPA practice.

Q. The road we were pointing out was on Government Exhibit No. 8, it was this road (indicating)--I should have you point it out a little more.

MR. O'CONNOR: Would you have him identify it? It only goes into part of this. It is on the south--

MR. BERMAN: I will let him identify it.

MR. O'CONNOR: All right.

MR. BERMAN:

Q. Could you mark that road that leads to the dock, or it is more of a path that you referred to here on this (indicating)?

A. Shall I circle it?

Q. Outline it, if you can. Well, it doesn't seem to show

up.

A. It doesn't seem to show up on this.

Q. Well, I will just have you identify it, what part of the picture?

A. Upon entering the site, to the left of the site is a small area which leads to a concrete dock. The last time I inspected the site this area was free of drums and the material was not stored in it.

I think your question was, what would happen if drums were stored in that area?

Q. Yes, what would happen?

A. Obviously that would make any accessibility to the rear of the site more impossible.

Q. Is there an NFPA standard concerning stacking drums on the bare ground?

A. There is not a standard, it is recommended they be stored on a stable surface, which I suppose could be ground in some cases. But generally, this is taken to mean concrete or pallets.

Q. How were the drums stored at this site?

A. Some of the drums are on a concrete surface, especially those right around this concrete dock to which you were referring earlier. But most of the drums on the site are directly on the soil, and apparently have been

put there in somewhat a haphazard condition. Once again, the drums are two to three on top of one another, some are toppling in fact, so that the situation is very potentially hazardous.

Q. Based on your own observations, what is your opinion, and also the pictures we have shown you today, what is your opinion as to whether the site at 7400 West 15th Avenue is imminently hazardous to health and the environment?

A. It is my professional opinion that this site poses imminent hazard to health and environment.

Q. Could you please explain that?

A. Yes. If a fire were to erupt on this site there would be thousands of drums of flammable material involved in this. The air would easily become saturated with unburned toxic vapors, at least the examples of the materials we know to be on the site are toxic. A fire of this nature also generates an enormous amount of carbon monoxide, the fire would be a particular threat to the health of the fire fighters who were called to the scene of this fire, or were to respond to extinguishing it.

It would also be a particular threat to the health of those individuals who happened to be in

the immediate area, in the factory nearby, people driving along the street, and depending on the weather conditions, these vapors could be spread over a relatively large area, thereby exposing all these various human beings to a health threat.

It would also be an environmental threat due to the fact that many of the substances are leeching into the soil. The soil on the ground is sandy, and I am not a geologist, but it is obviously quite permeable to liquids. These materials could easily leech through the soil and ultimately reach ground water, which would again contaminate water supplies for the public.

Q. What could be the effect of inhalation of some of the combustion products to individuals?

A. Yes, carbon monoxide is a well-known example of toxic gas, that is, it forms an incomplete combustion of organic compounds, because the large number that would be on the site, there would be certainly large concentrations of carbon monoxide formed. In addition, inhalation of unburned vapors could lead to headaches, to convulsions, dizziness, and in extreme situations to death.

Q. In your opinion, what measures should be taken to

reduce the fire hazard at 7400 West 15th Avenue, that site that you have identified in Government Exhibit 8, I believe?

A. I think it is necessary, first of all, to reduce the large volume of material that is on this site. This can be done quite easily, I suppose, the burned-out drums could be sold to people who are interested in reclaiming steel from secondary sources such as this.

The toxic substances that are leaking from corroding barrels should be removed in an environmentally accepted manner to a land fill site. This means to package the material in a good, sound barrel that is not corroding, properly labeled according to the Department of Transportation poison label, referring to toxic substances. Once again, to ship this off to a land fill site. The reduction of the large volume is the principal thing that should be done.

The soil is also quite saturated with toxic materials. It would be necessary to do further testing to discover just how far into the soil these various materials have leeched, but if we assume, for example, that most of the material has been confined to the upper three feet, let's say, of soil, then

that material, that soil even should be scooped out, put into barrels and carried off in an environmentally acceptable manner to a land fill site.

Q. Do you have any recommendation as to how high barrels or drums of flammable materials should be stacked?

A. I have no personal recommendation, but to follow the NFPA standards, I believe flammable solvents should be stored in lots not to exceed 20 barrels, and especially each of the various lots should be accessible to emergency fire-fighting equipment.

Q. Do you have a recommendation as to what type of emergency fire equipment should be available on the site?

A. Minimally one should have on the site portable fire extinguishers, or water should be certainly available so that if a small fire erupted it could be extinguished rapidly before a major fire resulted.

Q. Would you recommend, then, in addition to the portable fire extinguishers, there should be water available from hydrants?

A. Certainly.

Q. That there be adequate fire lanes?

A. Certainly.

Q. What type of security would you recommend for the site?

A. In view of the large number of flammable constituents and toxic materials that are known to be on the site, I believe the entire area should be fenced, and some sort of surveillance done periodically, perhaps every eight hours or so, to assure that no vandalism or fire has initiated.

Q. How should the drums be segregated at the site?

A. The drums should be segregated according to the general nature of their contents. The segregation I mentioned earlier is quite acceptable, namely, oxidizers kept in one area, corrosives in another area and flammable solvents be kept in another area.

But once again, within the area where the flammable solvents are stored, they should be stored in lots that do not exceed 20 drums, based on the flash point information.

Q. If this was an actual site being run, what type of check-in system should they have for new drums coming on the site?

A. If the solvent reclaiming operation was still in effect on this site, I think it would be good business practice to catalog what came in and went off the site.

Q. Are you talking specifically as to each group of

barrels, or individual barrels that came in?

A. I should think the individual would be aware of what he was purchasing and what material was leaving the site.

Q. What type of--should there be any safety equipment for the workers on the site?

A. Very definitely. Minimally, such things as showers in case a worker splashes a corrosive acid upon his skin, there should be a means of washing off the worker. And safety goggles. I would say that generally whatever regulations of OSHA there might happen to be, that operation should be in compliance with those regulations.

Q. In addition to the chemicals I mentioned, that I listed above, other samples taken on April 24, 1979 at 7400 West 15th Avenue site, showed the following items: Cyanide, 8300 milligrams per kilogram; Phenols at 990,000 milligrams per kilogram; Lead at 12,000 micrograms per kilogram, and Chromium at 48,000 micrograms per kilogram.

Cyanide, lead and chromium were found in one of the barrels, phenols were found in a trough on top of the loading dock, which is opening onto a tank under the loading dock. I would like you first

to characterize the individual chemicals, and indicate what effect those chemicals at the reported levels could have.

A. Cyanides occur chemically in three different forms, solid, liquid organic and metallic, and in all cases cyanides are poisonous, both by inhalation in the case of gaseous hydrogens, and by absorption through the skin or ingestion in the other case.

The water quality criteria which is the basis upon which the USEPA recommends levels in drinking water is set for cyanide in only 0.005 parts per million, and since the data indicates 8300 parts per million, this is away in excess of the acceptable standards that the USEPA follows. In other publications one can find that the threshold limit value for cyanide by absorption through the skin as 10 parts per million. This is an exceedingly small number. If we could imagine having a million molecules, only ten of the molecules were cyanide, then that particular concentration would be safe for the average adult, whereas the concentration exceeding that value would be likely to be quite hazardous, and even more so in an individual who happens to be suffering from a heart ailment or respiratory ailment, and similar

conditions.

Q. What is a threshold limit value?

A. That is the concentration of toxicants to which an average healthy individual may be exposed on an all-day, everyday basis, without experiencing adverse effects. Consequently, any number beyond, any concentration beyond the threshold limit value would be quite hazardous for the normal healthy adult.

The second compound I believe you mentioned was lead, if that is correct.

Q. I mentioned phenols, but go ahead.

A. Compounds of lead are also known to be toxic when ingested. When ingested into the body it leads to a fragility of the red blood cells, such that they are destroyed at a more rapid rate than ordinarily. When lead is ingested most of it passes out of the body, but some is retained, and in fact, lead is a package of what is known as accumulative poison, that is, the concentration builds up in the human body until disability or death occurs. The common symptoms resulting from lead poisoning initiate with conditions such as dizziness, headache, convulsions, leading once again, ultimately to death.

In victims who are exposed to the lead,

but do not die, or who are not yet dead, ingestion of lead will lead to danger to kidneys and liver. Consequently, the water quality criteria for ingestion of lead is 0.05 parts per million, and we have had various levels discovered in our analyses, all of which are far in excess of the value mentioned.

The next one is phenol. Phenol is a toxic compound which is water soluble. It is very, very corrosive to the skin and tends to cause lesions and sores on the skin when in contact. It is a particularly hazardous material from the point of view of environmental damage, since dissolved phenols can consume the oxygen that is dissolved in water, thereby killing off fish and other aquatic life.

MR. LICHT: Your Honor, I don't wish to interrupt, but the Professor has been talking about water pollution and so forth, which is really not the case on this site. We are not speaking about streams or flowing water, at least I don't believe so at that particular site. I would raise that tentative objection.

THE COURT: The objection is overruled.

MR. BERMAN:

Q. Go ahead.

A. It is quite possible that any of these toxic materials which would leech into the waterway and thereby ultimately lead to the ground water and normal water supply for the public, which in turn makes the leeching of various materials of the soil quite hazardous. For phenol we have had values as high as 990 parts per million. The acceptable level given for water water quality criteria is only 3.4, so once again we are far, far in excess of the acceptable value.

Then I think the fourth substance you mentioned was chromium?

Q. Correct.

A. Chromium is also known to be quite toxic, and they are particularly so when chromium is in its highest oxidation state, which is commonly found in dichromate and chromate, which are oxidates. This material is known to be a carcinogen when ingested. It also forms lesions on the skin. It can in some compounds be quite corrosive on contact with the skin. It also does kidney and liver damage when ingested.

The acceptable water quality criteria is 0.1, and our evidence gives numbers around 48 parts per million, so in all the various examples which have been cited here, the materials are examples of very,

very toxic materials. And the concentrations which have been detected on the site are far, far in excess of values which are accepted, based on our water quality criteria.

Q. Could you explain the hazards of cyanide?

A. Again?

THE COURT: That has already been gone into.

MR. BERMAN: Okay.

Q. Would you please define corrosive?

A. Yes. A corrosive material is a substance which upon contact with the skin leads to physical damage at the site of contact. An example is hydrogen peroxide.

Q. It was testified to that solvents, oils, caustics, acids, cyanide, insecticides and pesticides were dumped in the ground at this site of 7400 West 15th Avenue. What potential hazard could this present to the soil and the ground water? I would also like to indicate that it was also testified to that a trench was dug, with dimensions such as eight feet deep, 100 feet long and 30 feet wide--I am approximating that, and similar materials were poured in the trench. I would like you to indicate what potential hazard could this present to the soil and the ground water?

A. The dumping of toxic materials into a pit which is

surrounded by permeable soil means that these materials will not stay localized to this particular area, but rather, will permeate through the soil as ordinary rain water advances through it, leading thereby to contamination of the ground water source, and ultimately to ingestion of these various materials by human beings as well as other life.

None of the toxic materials that were detected here is biodegradable, consequently they remain in our environment until chemically destroyed. They are not biodegradable.

Q. What recommendation do you have for the lagoons or ponds on the site, or around them? Well, I will withdraw that for this moment.

I think what I was trying to elicit when I talked about cyanide, I was looking for--I don't believe we touched on the particular effect it has on individuals.

A. Ingestion of cyanide leads to respiratory arrest, on people who have ingested cyanide.

Q. Okay. Have you inspected the site at 5900 Industrial Highway that we have been referring to at this hearing as Midco #2?

A. Yes, I have.

Q. When did you inspect that site?

A. I first visited the site on the 7th of September, 1979, and once again on the 14th of December, 1979.

Q. What did you observe at that time?

A. This site is an area that consists mostly of thousands and thousands and thousands of burned-out drums, and in many, many cases the contents of the drums were spilled out into the soil, as a result of rupturing drums, apparently. There are approximately 20 drums on the site that still contain toxic, or at least hazardous materials. There are several upright tanks that contain materials.

In the rear of the site is a stream which is located at a lower level than the property level itself, such that the various hazardous materials that have been stored on the site are leeching into the stream.

There is also an almost completely buried tank on the site which contains an oil liquid material.

I believe that covers what I saw.

Q. The analysis of the samples from the 5900 Industrial Highway site revealed the following chemicals: Cyanide, chromium and lead, which we have already characterized, and in addition the samples showed

arsenic and cadmium. I would like you to characterize the hazard of arsenic and cadmium.

A. Ingestion and inhalation of the compounds of arsenic lead to death in sufficiently high concentrations. Like lead, this is a package of accumulated poison, meaning once again that smaller amounts will bio-accumulate until a concentration is reached at which death would result. In lesser amounts ingestion of arsenic would lead to the disease which is a thickening of the skin. Ingestion of arsenic will also cause liver and kidney damage.

The EPA Water quality criteria is 0.005 parts per million for ingestion of lead, and our data indicates 44 parts per million, so the area is far in excess of the acceptable value.

Cadmium compounds are known also tobe poisonous, although the physiological mechanism by which cadmium poisons is not known. It is, once again, a well-known example of a toxic substance. Cadmium will also cause gastro-intestinal degeneration upon ingestion. The EPA water quality criteria is 0.011, and our data indicates 440 parts per million, so the concentration in all the six chemicals you mentioned are far in excess of what our water quality

data suggests is acceptable levels.

Q. The samples also showed the following organic compounds, P-Xylene, m-xylene, 2-Ethoxyethanol, 2-n-Butoxyethanol, Isophorone, Naphthalene, Methyl Naphthalene and Tetramethyl Benzene.

Could you characterize these chemicals?

A. The various materials you mentioned are examples of flammable materials, and a number of them are also toxic materials when ingested.

Q. Could you define toxic, please?

A. Poisonous.

Q. Have you had an opportunity to review the data, the results of the samples of August 28, 1979, as concerns the above chemicals?

A. Yes, I have.

Q. I would refer you to some of the data results that are in Government Exhibit 47, and there is one more government exhibit, which I will have to give you the number later, Government Exhibit 47 lists inorganic compounds. Have you had an opportunity to review the data results from samples 79-CB48S01, which was taken from an underground tank?

A. Yes, I have.

Q. In addition, it has been testified to here that the

EPA sampler had swelling and redness on his arm from coming in contact with the liquid in the tank.

THE COURT: We don't need to go into that.

MR. BERMAN: Okay.

Q. Would you please, in your opinion, state what are the hazards to an individual who would come in contact with the chemicals in the underground tank?

A. We have shown this liquid is very corrosive, such that contact with the skin is likely to lead to a reddening of the skin. If the material is not removed, it could lead to pain, it could be absorbed through the skin. If the concentration was sufficient it could be possible even for death to result.

Q. Have you observed this tank yourself?

A. Yes, I have.

Q. Is it possible, for one to fall in the tank?

A. It is very possible for someone to fall in the tank, especially if the lid is removed, and one was falling around or near it, especially for young children. It would be quite possible to fall in the tank.

Q. What type lid does it have?

A. It is just a lid that can be thrown back quite easily.

Q. If liquid in the tank struck someone in the eye, could it have an effect?

A. Because it is corrosive material, contact with the eyes could be quite serious, leading almost definitely to blindness.

Q. On August 28, 1979, samples were also taken from the residue from drums at 5900 Industrial Highway. These samples show cyanide residues. Have you reviewed these analyses for the sample numbers CB48S04--the reason I am reading the numbers is because we referred to them previously as CB48S01 to CB48S14.

Have you reviewed the test results?

A. Yes, I have.

Q. What is your opinion as to the hazards of these drums concerning the cyanide content?

A. The concentrations in these various drums are all far in excess of ten parts per million, mentioned earlier as the threshold limit value for absorption through the skin. The concentration of 51.2 in one case, even 36,600, such a number indicates almost pure cyanide, in fact. So this particular sample is especially toxic.

THE COURT: With regard to the property at 5900 Industrial Highway, the Court is convinced that beyond any doubt in his mind the site is

dangerous and hazardous. You may continue, if you wish, but I feel it is completely unnecessary as far as the proof is concerned.

We will take a short recess at this time.

MR. BERMAN: Thank you.

(After a short recess, the following proceedings were had, reported as follows:)

MR. BERMAN: We just have a couple more questions for this witness.

Q. In the 5900 Industrial Avenue site, what would be your recommendation for eliminating immediate hazards?

A. To eliminate immediate hazards I would suggest that the fencing on the site which is currently in a state of disrepair be repaired so that ordinary entry to the site is not possible.

I also think that the tank, partially buried tank on the site represents a particular threat to the health of individuals who happen to be on the site. One of our EPA investigators saw a young boy on the site picking up scrap metal on the day that he was there, which points out that entry is quite possible. I think the contents of that tank should be removed, and taken off to an approved land fill site or incinerated, as a first measure.

I think ultimately the site needs to be rehabilitated further by once again testing for areas where concentrations of these various toxicants are particularly high, this soil, again, being removed, put in drums and carried off to environmentally-accepted

land fill sites.

Q. Do you have any particular immediate recommendation for the cyanide on the site?

A. Yes. We have evidence once again there are large concentrations of cyanide coming from drums that have corroded or ruptured on site, because of the very large concentrations, once again, something like 36,600 parts per million. These drums, the contents should be put into good, non-corroding drums, and taken off to a land fill site.

Q. One last question. Is there any immediate recommendation where the large tanks have liquids in them?

A. I do not believe that any immediate action is necessary. We do not have evidence as to what the contents of these drums are. By the nature of the business that went on at the operation, we can assume that they are flammable materials; however, the tanks are sealed and I don't think they pose a particularly imminent hazard, at the moment.

MR. BERMAN: Thank you. I have no more questions.

CROSS EXAMINATION
By Mr. Licht:

Q. Dr. Meyer, you had earlier, in response to Mr. Berman's

questions described various long chain hydrocarbons, I won't go into the names, but those that were mentioned in the complaint,--

A. You are referring to the decane derivatives?

Q. Right. Isn't it a fact that those chemicals are actually the usual and ordinary components of paints?

A. Yes.

Q. And paint solvents?

A. Yes, they are.

Q. Would it be fair to say that these chemicals could be found regularly and ordinarily in plants which manufacture paint?

A. These compounds are found in any industry that uses non-latex type paint. Water soluble latex paints are different derivatives.

Q. These would be rather common chemicals in and around the Hammond area?

A. I am not familiar with the Hammond area, but they would certainly be found in any place that would have paint stored.

Q. So that an industrial paint factory, for example, Standard, which is a local factory, would indeed have such chemicals if they were manufacturing industrial paints?

A. I would assume so.
Q. You mentioned that when you inspected the site, and we were together, I think it was December 14th?
A. That's correct.
Q. There were various drums stacked to the east of Blaine Avenue, and you testified that they were, I believe you said caustics?
A. Oxidizers and--
Q. Oxidizers, yes.
A. --corrosives.
Q. Yes. You, however, had not yourself tested the drums?
A. That's correct.
Q. You do not have direct knowledge of the contents?
A. That's correct.
Q. You are surmising the contents?
A. Yes. That is based upon the fact that the Department of Transportation labels are intact on many of these drums, as I believe I stated here during my testimony. Quite frequently the label is not necessarily an indication of what the contents of the drum happen to be, simply when a waste is discarded it is put into whatever drum happens to be available. However, in this particular instance it turns out that all of the various drums that have the oxidizer label happen to

be in one area, all those with the corrosive label in another area, and the flammable liquids yet in a third area, which is the larger area. I think that tends to point out that someone was aware of the incompatible nature of the various materials and thereby stored them in separate areas, possibly for the mere purpose of reducing the fire hazard.

Q. You surmised this by your indirect deductions?

A. That's correct, I have no direct evidence.

Q. Now, you mentioned various barrels which were bulging.

A. That is correct.

Q. And when we were there on December 14th, in the course of our conversation, I believe it was pointed out that if barrels were filled with water-base materials, and they froze, such barrels would also bulge?

A. That is correct.

Q. So it is possible that some of those barrels which we saw, and which were there, at least they had been there up until a few days ago, could be water-based materials?

A. What you are saying is absolutely correct, water has the characteristic of expanding as it freezes, so if the drums are filled with water or water solutions, they will also also expand and bulge outward.

Q. Therefore, it is reasonable to say that those drums don't necessarily contain vapor under pressure, which I believe you testified they did.

A. A second way of having a bulging drum is by way of build-up of internal pressure due to the large amount of vapor internally. But--

Q. But my point simply is this--

MR. BERMAN: Can he finish his explanation?

MR. LICHT: Since I am cross examining, I can--

THE COURT: The Court decides that.

MR. LICHT: I am sorry, sir.

THE COURT: That is all right.

MR. LICHT: My apologies.

THE COURT: That is quite all right. The witness will be permitted to finish his answer.

MR. LICHT: I am sorry, Judge.

THE WITNESS:

A. There are two ways by which a drum could bulge. One is by the build-up of internal pressure due to super heating the liquid, generating a lot of vapor which in turn generates internal pressure. The second is by water or water solutions freezing and thereby expanding and bulging the drum outward also.

MR. LICHT:

Q. And once the drum were bulged out--

A. It stays bulged out.

Q. Yes.

A. That's correct.

Q. So those drums could have been water solutions, rather than--

A. That is a possibility.

Q. It could be one or the other, you really don't know which one it was?

A. Not precisely.

Q. That is the answer I want. You really don't know precisely which they were in those barrels?

A. That's correct. May I also add one other thing? They also have chemical evidence to indicate what particular substances were on the site.

Q. But with respect to those particular barrels--

MR. BERMAN: Again. may he finish his answer?

THE COURT: I think he did. You may proceed with your cross examination.

MR. LICHT:

Q. Did you want to say something else?

A. No.

Q. Thank you.

A. Thank you.

Q. I don't want to badger as distinguished a witness as Dr. Meyer.

Now, regarding the flash point, it is a fact that flash point is really a laboratory procedure, is it not?

A. That's correct.

Q. And the testing of flash points takes place in a laboratory apparatus?

A. That is correct.

Q. That in order for a substance to be tested for flash, a flame must be introduced?

A. That is correct.

Q. I want to make it clear to all of us that flash point does not mean a spontaneous combustion just because a vapor has reached a given temperature.

A. That is correct.

Q. So that a chemical with 63 degrees Fahrenheit flash point, vapor at that temperature does not automatically explode, or burn?

A. That is correct, not until an ignition source is introduced.

Q. Now, of course, the testing in a laboratory is in a controlled and standardized environment?

A. That is correct.
Q. It is done that way in order to have some rational way of testing chemicals?
A. That is correct.
Q. But outdoors, with the wind blowing, and with different degrees of temperature and currents and wind speed, would it notbe fair to say that the existence of 63 degrees Fahrenheit ambient, would not necessarily allow for a flash or a burning at a particular spot?
A. Once again, the various criteria which are necessary for combustion are such things as being within the flammable range, and having the liquid at this particular flash point. If a liquid is at its flash point, and if the vapor of the liquid is within its flammable range, which of course would be totally independent of wind conditions, the wind might dissipate the vapor, or whatever, but if its within its flammable range, the material will definitely burn.
Q. If the wind dissipates the vapor, you would not have a proper concentration?
A. That is correct, it would be below what is known as its lower explosion point and then the material will not burn.

Q. My point is that while in a laboratory apparatus, these conditions can be kept controlled?

A. Yes.

Q. And the outside, at this site, such conditions would not remain constant and could reasonably be expected to fluctuate?

A. There is no question nature does not control its experiments.

Q. Very good. Now, you mentioned the NFPA standards.

A. Yes.

Q. And I would ask you whether it is your knowledge, or do you have knowledge as to whether these standards are univerally used in industry?

A. Once again, the NFPA makes the standards, it does so by requesting members from various interested industries to become, or to participate in a panel whereby such issues are studied over a long period of time and recommendations then are made, as a result of the meeting of these various experts. Whether or not these NFPA standards are adopted is up to the individual choice of anyone.

I believe you used the word internationally, or universally, I have absolutely no idea of European or Asiatic adoption of these, but at least within our

nation it is quite common to see NFPA standards accepted by at least the major municipalities.

Q. Well, now, have you ever visited any industrial plants where chemicals of this sort are stored where such chemicals are stored in larger quantities and in larger concentrations than the NFPA standards?

A. Well, since my employment with USEPA I have been visiting sites which are literally chemical waste sites, and there has always been some question as to them posing an imminent threat to the health and environment. I am afraid the nature of my job description does not entail me to visit sites where chemicals are properly stored.

However, prior to my employment with the USEPA, I have had the opportunity to visit a number of different chemical industries. Frankly, at that point I was not interested in whether they were in compliance with the NFPA, or not in compliance with NFPA standards. I may not have been aware of them at that time.

On recollection, I am afraid I couldn't answer one way or the other as to whether they were in compliance, without revisiting the sites and actually making a direct observation.

Q. You mentioned a standard referring to 20 drums per lot. And the size of the lot was never defined.

A. Yes. Actually what the NFPA ascribes is by number of gallons based on the class. I believe I mentioned in my testimony that 1100 gallons are permitted per any one of these lots for a Class 1-A liquid.

Q. May I interrupt you, sir?

A. Certainly.

Q. By lot, you mean parcel of land?

A. I don't mean a parcel of land as we classically think of a lot, but rather a small subdivision on some acreage.

Q. Excuse me, you didn't mean a lot of drums, you meant square footage of land?

A. That is correct.

Q. That is what I wanted to find out. How large are these lots that they refer to?

A. The size depends on the number of drums you could get on there. Once again, with reference to a Class 1-A,--

Q. For instance, what would that be?

A. I would have to make a measurement, a 55-gallon drum if completely filled, it would take 20 drums to come up to the total of 1100 gallons. Now, obviously, the size would depend on whether you

stacked them one on top of one another, or side by side, but I think you could get some feeling. A 55-gallon drum is roughly about, maybe two to two and a half feet across. I would suggest we are talking about maybe an area of what, ten by--

Q. Ten feet by--

A. By six, to get 20 drums. You would have two rows of ten drums, depending on how you wanted to stack them.

Q. The point is, Dr. Meyer, the reason I mentioned this is because in the course of this trial reference has been made to lots as the word is used in land mapping.

A. Yes.

Q. And these lots on the NFPA do not refer to land lots?

A. No they do not, not whatsoever, and I did not mean to confuse you in that manner. I did not mean to use the word as the ordinary mapping type lot. I am just referring to an area in which one would keep all the drums. This area would be separated from another similar area by five feet, which in turn is separated from another area by five feet, on and on and on, each of these independent little ones being completely accessible by means of emergency fire-fighting equipment.

Q. I think you mentioned also they could be stacked?

A. It is possible to stack them.
Q. When you say possible--
A. The NFPA does not regulate or give suggestions on how high you should do this, whether it should be two or three or four. It simply says to not have any more than one single lot - more in one single lot than 1100 gallons.
Q. I see. I am glad you clarified it because it wasn't clear to me.
A. I am sorry I didn't make it clear.
Q. Would you have any opinion, if you do, as to the length of time this Midco #1 site may have been used as an industrial site, judging from the accumulation and the volume of material on it - if you have an opinion on it?
A. I think that would be impossible to ascertain because you could run between various extremes. In one case everything coming onto the site could never be removed, which means you continue to accumulate more and more barrels. I think in normal business operations on the other hand, you will be bringing some in, taking some off.
Q. What I meant was, do you have any idea as to how low long, how many years this Midco #1 site has been in

operation, judging from what you saw on it? If you have no opinion--

A. I have no opinion.

Q. All right. Did you ever have any experience in experimentally starting a fire at a site of this sort?

A. No, I have never struck matches on such a site.

Q. Have you ever dealt with actual models of such sites?

A. No, I have not.

Q. So that you cannot really speak of the practical requirements of starting a holocaust fire on such a site, except from your theoretical background?

A. That is correct.

MR. LICHT: Thank you. I have no further questions.

MR. O'CONNOR: V and E has no questions.

THE COURT: Any redirect?

MR. BERMAN: Yes.

REDIRECT EXAMINATION
By Mr. Berman:

Q. If the drums were stored at another site, whether it be a factory or another open-air site in the manner they are stored at 7400 West 15th Avenue site would you also consider that to be a hazard?

A. I don't believe I understand the nature of your question.

THE COURT: I really don't think that is an area I wish to explore.

MR. BERMAN: All right. Thank you. No further questions.

THE COURT: You may step down, sir.

(Witness excused.)

THE COURT: Call your next witness.

MR. BAKER: The Government rests, your Honor.

MR. O'CONNOR: I have a motion for V & E. May I be heard?

THE COURT: You may.

MR. O'CONNOR: The defendants Victor Kirsch, John Kirsch, Eva Kirsch and V and E Corporation move the Court for a finding for them and against the plaintiff, on the grounds there is either no evidence or insufficient evidence to establish the government's claim against these defendants for a preliminary injunction, ordering them to take any action of any kind as to the individual defendants Victor Kirsch, John Kirsch and Eva Kirsch. There is no evidence whatsoever that any of them in any way violated the

Act alleged in the Complaint, had any ownership interest in any of the land involved, had any knowledge that any solid wastes or hazardous wastes were being stored on any property anywhere, let alone V and E property.

There is no evidence they had any business or other relationship of any kind with any of the other defendants. There is no evidence they contributed to the alleged disposal of solid waste or hazardous waste of any kind.

Now, as to V and E Corporation, your Honor, the evidence here is that V and E Corporation owned a tract of land adjacent to the east to the land owned by defendant Midco and whatever interests other defendants had in the land to the west of V and E tract.

The V and E tract consiated of approximately 19 acres of vacant land lying in a heavy industrial area, vacant land on the west side of the City of Gary, in a heavy industrial area, and a rather isolated one at that.

The evidence is that some of the materials stored by the other defendants dripped over or got over onto the land of the defendant. Very few of them, very few of the drums and vessels, at that,